

## 03050207-020

(*Turkey Creek*)

### General Description

Watershed 03050207-020 is located in Barnwell County and consists primarily of *Turkey Creek* and its tributaries. The watershed occupies 19,917 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Wilkes series. The erodibility of the soil (K) averages 0.25, and the slope of the terrain averages 18%, with a range of 2-45%. Land use/land cover in the watershed includes: 37.5% agricultural land, 37.0% forested land, 10.0% forested wetland, 7.1% urban land, 6.8% barren land, 0.8% water, and 0.8% nonforested wetland.

Turkey Creek accepts drainage from Shrub Branch and Long Branch and flows through Lake Edgar A. Brown. There are a total of 21.6 stream miles and 358.1 acres of lake waters in this watershed, all classified FW. A portion of the Savannah River Site resides on the western edge of this watershed.

### Surface Water Quality

<u>Station #</u>	<u>Type</u>	<u>Class</u>	<u>Description</u>
CSTL-056	BIO	FW	TURKEY CREEK AT S-06-169
CL-064	W	FW	LAKE EDGAR BROWN IN FOREBAY NEAR DAM
CSTL-001B	S	FW	TURKEY CREEK 1MI BELOW MILLIKEN/BARNWELL OUTFALL AT CLINTON ST.

***Turkey Creek*** - There are two monitoring sites along Turkey Creek. At the upstream site (***CSTL-056***), aquatic life uses are fully supported based on macroinvertebrate community data. At the downstream site (***CSTL-001B***), aquatic life uses are fully supported. There is a significant decreasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are partially supported due to fecal coliform bacteria excursions.

***Lake Edgar Brown (CL-064)*** - Aquatic life uses are not supported due to chlorophyll *a* excursions. A total maximum daily load (TMDL) has been developed for CL-064 to address this impairment (see Watershed Protection and Restoration Strategies below). Although there was a dissolved oxygen excursion, due to the small number of samples, it was not considered to be a cause of nonsupport. A significant decreasing trend in total nitrogen concentration suggests improving conditions for this parameter. Recreational uses are fully supported.

### NPDES Program

### ***Active NPDES Facilities***

#### ***RECEIVING STREAM***

#### ***FACILITY NAME***

#### ***PERMITTED FLOW @ PIPE (MGD)***

#### ***NPDES#***

#### ***TYPE***

#### ***COMMENT***

TURKEY CREEK  
MILLIKEN & CO./BARNWELL PLT  
PIPE #: 001 FLOW: 1.30

SC0003093  
MAJOR INDUSTRIAL

## **Nonpoint Source Management Program**

### ***Land Disposal Activities***

#### **Landfill Facilities**

#### ***LANDFILL NAME***

#### ***FACILITY TYPE***

#### ***PERMIT #***

#### ***STATUS***

BARNWELL CO. TRANSFER STA.  
TRANSFER STA.

061001-6001  
ACTIVE

BARNWELL COUNTY LANDFILL  
DOMESTIC

061001-1101, DWP-001  
INACTIVE

BARNWELL CO. C&D LANDFILL  
C & D

061001-1201  
ACTIVE

## **Growth Potential**

There is a low to moderate potential for growth in this watershed, which contains a portion of the City of Barnwell. The junction of S.C. Hwy 64 and U.S. Hwy 278, en route to SRS, is an area of potential commercial growth. U.S. Hwy 278 is projected to be widened and could support commerce, and perhaps industry in the Williston and Blackville areas.

## **Watershed Protection and Restoration Strategies**

### ***Total Maximum Daily Loads (TMDLs)***

Lake Edgar Brown water quality violated aquatic life standards and did not possess a balanced indigenous aquatic community as defined by the state. Past management efforts have resulted in the lake possessing an overabundance of phosphorus with no potential for removal through normal hydrologic processes. The high phosphorus loading, in conjunction with the lake's physical characteristics and the region's long growing season have resulted in an ecosystem dominated by nuisance algae (primarily *Polycystis aeruginosa*) and other phytoplankton. During periods of high photosynthesis, the conversion of carbonate into carbon dioxide results in the release of excess hydroxide ions, raising the lake's pH above the state's water quality standard. High phosphorus loads produce high primary productivity, which result in high pH. The objective of this TMDL is to restore ecological balance through the removal of excess phosphorus (thus decreasing primary productivity and lowering pH) until an average phosphorus concentration of 60 mg/m<sup>3</sup> is attained. This TMDL focuses on the effect reestablishing Turkey Creek, as a tributary, will have on the present phosphorus cycle in Lake Edgar Brown and how alterations in this cycle will affect primary production. Calculations indicate that a partial or complete reestablishment of Turkey Creek as a tributary to Lake Edgar Brown should have significant effects in reducing phosphorus

contributions from the sediments, water column phosphorus concentrations, algal growth (as represented by chlorophyll *a* levels) and pH because: 1. The continuous flow of oxygenated water should reduce the instances of anoxia at the sediment water interface and limit phosphorus release from the sediments. 2. Increased flushing will remove phosphorus suspended in the water column and both phosphorus and chlorophyll incorporated in phytoplankton biomass. As long as the flushing rate exceeds plankton growth rates, recurring algal blooms will not be a problem. Removal of phytoplankton and decreasing primary production will result in decreased pH. A 77% reduction in phosphorus loading is will be necessary to meet water quality standards during the critical period. By necessity, this reduction will come almost exclusively from the sediments.